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ABSTRACT

Carroll's (1963) model of school learning and Bloom's (1968) mastery learning both address theoretical and practical aspects of the time factor in school learning via an appeal to diagnostic-prescriptive teaching. The design of instructional environments and materials--particularly as advocated by Glaser (1976)--represents the mechanism to bring to fruition the work of Carroll and Bloom. This paper suggests a systems-based approach to designing an instructional unit that (1) accommodates the earlier efforts of Carroll, Bloom, and Glaser, (2) focuses on the preparatory, delivery, and evaluative tasks of instruction, and (3) has applications in virtually every part of the psychology curriculum. (Contains 22 references and three figures). (Author)

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Instructional Design Applications in the Teaching of Psychology

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Abstract

Carroll's (1963) model of school learning and Bloom's (1968) mastery learning address both theoretical and practical aspects of the time factor in school learning via an appeal to diagnostic-prescriptive teaching. The design of instructional environments and materials--particularly as advocated by Glaser (1976)--represents the mechanism for bringing to fruition the work of Carroll and Bloom. This paper suggests a systems-based approach to designing an instructional unit that (a) accommodates the earlier efforts of Carroll, Bloom, and Glaser, (b) focuses on the preparatory, delivery, and evaluative tasks of instruction, and (c) has applications in virtually every part of the psychology curriculum.

Instructional Design Applications in the Teaching of Psychology

In an earlier paper (Hymel, 1992), an argument was made for Carroll's (1963) model of school learning and Bloom's (1968, 1976, 1978, 1980) mastery learning as foundations for the teaching of psychology. The principal intent of this paper is to propose another major area of educational psychology--viz., instructional design--as a vehicle for bringing the themes of Carroll and Bloom to bear upon the actual tasks of preparing, implementing, and evaluating instruction. Instructional design applications, then, represent the mechanisms for actually bringing to fruition the theoretical and practical aspects of both Carroll and Bloom's work.

A Brief Review

Carroll's Model of School Learning

John B. Carroll's (1963) model of school learning is a theoretical paradigm that describes the degree of learning that occurs in a school setting as a function of the time spent by a student on a learning task divided by the time needed by the student for the mastery of that task. The model, then, is formulated as follows:

$$\text{Degree of Learning} = f (\text{Time Spent/Time Needed})$$

Additionally, Carroll's model suggests that a student's time needed to learn a particular task is determined by such variables as the student's aptitude and ability to understand instruction as well as the quality of instruction to which the student is exposed. Regarding the numerator in the model, time spent, Carroll identifies such factors as student perseverance on the learning task and opportunity to learn as the principal determining variables.

Bloom's Mastery Learning

Essentially, mastery learning may be characterized as an increasingly expanding research area in educational psychology that is predicated on Carroll's model and entails two major dimensions (Bloom, 1968, 1976, 1978, 1980): First, it encompasses an optimistic set of theoretical assumptions regarding the capability of students to learn what we have to teach them provided that certain alterable variables constituting the essential conditions of learning are optimized. Secondly, it incorporates an array of adaptive instructional procedures reflective of the medical model of diagnostic-prescriptive intervention. Success or failure in school learning, then, is

largely an artifact of the extent to which we adequately accommodate specific learner-based and instruction-oriented variables considered to be alterable rather than static. Additionally, mastery learning is founded on Carroll's model in that both are concerned with the relationship between the concepts of time as a variable and high student achievement as a constant.

The Essentials of Instructional Design

The process of instructional design involves specifying and producing particular environmental situations in the classroom that incline students to react in such a way that a specified change in their behavior has a high probability of occurring (Merrill, 1971). In a seminal publication in 1976, Robert Glaser identified the following components of a psychology of instruction as essential to the design of instructional environments: (a) analysis of the competent performance to be achieved, (b) description of the initial state of the learner from which learning proceeds, (c) conditions that can be implemented to bring about a change from the initial state of the learner to the state of competence desired, and (d) assessment of the immediate and long-range effects of instructional implementation.

In a somewhat similar fashion, a comprehensive model of instructional design has been proposed (Hymel, 1984) that accommodates Glaser's four components by focusing on the preparatory, implementation, and evaluative activities or phases of instruction. These three phases of instructional design are further viewed as applying to three levels at which instructional design occurs; viz., the program syllabus, course syllabus, and instructional unit levels (in the case of, e.g., an undergraduate psychology program, an educational psychology course, and an instructional unit on behavioral psychology). The relationship between the phases and levels of instructional design is such that the activities of preparing, implementing, and evaluating instruction represent (a) the means to generating instructional products or documents labelled program syllabus, course syllabus, and instructional unit and (b) the tasks that are actually engaged in by the instructor in the attempt to interact with students at three different levels in the instructional process. Figure 1 is a simple illustration of the predominantly deductive movement in the overall process of designing instruction at the program syllabus, course syllabus, and instructional unit levels.

Insert Figure 1 about here

The instructional unit represents the most specific level at which instruction is designed and, consequently, has been selected for the discussion that immediately follows. Accordingly, Figures 2 and 3 display the systems-based model and checklist for preparing, implementing, and evaluating an instructional unit.

Insert Figure 2 about here

Insert Figure 3 about here

The various components of a unit are perhaps best considered in the context of the three phases of the design effort. Phase I--the preparing instruction phase--involves the following features: unit description and rationale, performance objectives, prerequisite competencies, and advance organizer for the sequencing of topics. Phase II--the implementing instruction phase--entails the coordination of such components as the selection and use of instructional methods, student activities/assignments, and instructional resources. Phase III--the evaluating instruction phase--spans such activities as formative evaluation for diagnostic purposes, learning correctives, summative evaluation for grading purposes, and unit evaluation.

Applications in the Teaching of Psychology

These several instructional unit components/activities serve to operationalize (a) Glaser's (1976) four components of a psychology of instruction identified earlier and (b) Bloom's (1968) call for adaptive instructional procedures that reflect a form of diagnostic-prescriptive intervention. Considered together, these various activities that constitute the preparatory, delivery, and evaluative phases at the unit level of design also serve to accommodate Carroll's (1963) concern for the time factor in school learning that necessitates a view of instructional/learning time as a variable in quest of high student achievement as a constant.

The professional literature acknowledges several efforts in many areas of psychology to accommodate the time factor in school learning via a diagnostic-prescriptive approach to instruction. For instance, mastery learning approaches that incorporate the various instructional design components highlighted above are

represented in the teaching of such curricular areas as abnormal psychology (Allen, 1984), child psychology (Santogrossi & Colussy, 1976), educational psychology (Burke, 1989), experimental design (Lockhart et al., 1983), general psychology (Bell, 1988), human growth and development (Lu, 1978), personality (Couch, 1986), social psychology (Ortega-Blake, 1982), and statistics (Koele & Vorst, 1978).

A consistency exists across the works of Carroll (1963), Bloom (1968), Glaser (1976), and Hymel (1984) where the design of instruction is concerned. This is born of a well-established scientific basis for teaching that, in turn, reflects our rather extensive knowledge base on human motivation and learning (see, e.g., Gage, 1978; Gagne, 1985; Gagne, Briggs, & Wager, 1988). Instructional design efforts sensitive to the time factor in school learning and reflective of adaptive instruction can and should be incorporated in the teaching of virtually every part of the psychology curriculum. To do otherwise would be tantamount to ignoring what our very own discipline has to say regarding scientifically established principles of learning and instruction. That, indeed, would be quite ironic and tragic.

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Figure 1

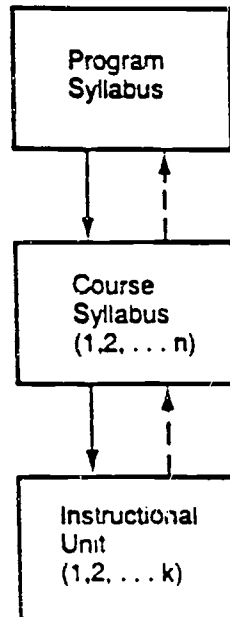
Systems-Based Model for Designing Instruction

Figure 2

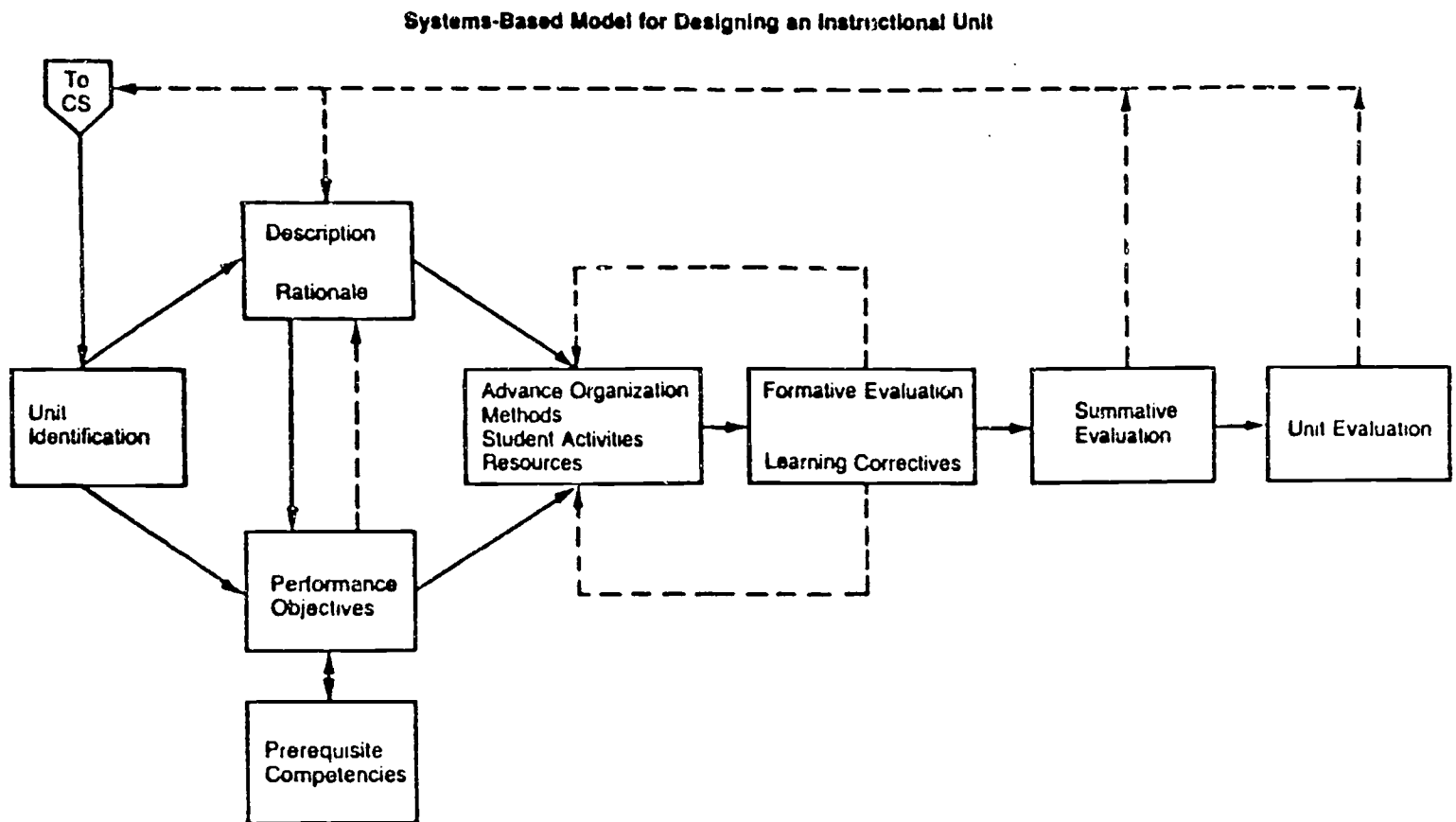


Figure 3

Checklist for Designing an Instructional Unit	Check When Completed
1. Identify the topic addressed in the unit.	
2. Describe in narrative form the subject matter content of the unit.	
3. State the rationale for the inclusion and location of the unit in the course.	
4. List the performance objectives for the unit.	
5. Identify and/or construct a test for prerequisite competencies.	
6. Outline in detail (via an advance organizer) the various topics and subtopics which comprise the unit.	
7. Identify the instructional methods used in the unit.	
8. Identify the various learning activities in which the students will engage as they proceed through the unit.	
9. Specify the resources utilized in the unit.	
10. Construct a formative test that addresses itself to the performance objectives of the unit and that serves a diagnostic purpose.	
11. (a) Identify various activities and assignments of a review and/or remedial nature to which a student would be recycled in order to correct certain learning deficiencies uncovered by the formative test.	
(b) Prepare a form that reports the results of the formative test and establishes a correspondence between items missed on the formative test and learning correctives.	
12. Construct a summative test that addresses itself to the performance objectives of the unit.	
13. Construct a unit evaluation form that would be used to facilitate student feedback relative to the effectiveness of the instructional unit.	